JUNE 5, 1922

AVIATION

VOL. XII. NO. 23

Member of the Audit Bureau of Circulations

CONTENTS

THE GARDNER, MOFFAT COMPANY, Inc., *Publishers*

HIGHLAND, N. Y.

225 FOURTH AVENUE, NEW YORK

Subscription price: Four dollars per year. Single copies ten cents. Canada, five dollars. Foreign, six dollars a year. Copyright 1922, by the Gardner, Moffat Company, Inc.

Issued every Monday. Forms close ten days previously. Entered as second-class matter Nov. 22, 1920, at the Post Office at Highland, N. Y., under act of March 3, 1879.

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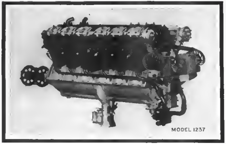

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Vol. XII JUNE 5, 1922 No 23

Air Transport in the Tropics

SOME highly interesting information regarding the manifold difficulties under which air transport labors in the tropics has recently been published by our French contemporaries *Les Ailes* and *L'Aéronautique*. To date only two airways function in strictly tropical climates; one is the 300-mile seaplane service which follows the coast of French Guayana from Cayenne to St. Laurent, whence it branches off into the interior, to Inini; the other, also a seaplane service, operates over a distance of about 1000 miles between Kinshasa and Stanleyville, in the Belgian Congo. It is with the experience acquired in the operation of these services that the information on hand deals.

French Guayana is a particularly fruitful field for air transport in that the country has no railroads, hardly any roads, and the habitual means of transportation are very primitive, consisting chiefly of native canoes which are paddled upstream in exhaustive journeys. The amount of time air travel saves under these circumstances appears from the fact that it takes native boatmen from fifteen to twenty days to cover a distance which seaplanes fly in two hours. In addition to the inconvenience the traveler suffers from such a boat trip, he has to pay the sustenance of the boat crew, which makes the journey very expensive. As a matter of fact, the aerial fare costs actually less than the canoe trip.

But the feature of great time saving would not make this service a success were there no incentive to travel. Such is not, however, the case in French Guayana, for the extensive plantations and mines which exist in the interior demand a frequent surveillance. Air transport derives there a further source of profit from the special kind of freight available, gold ores, which are very valuable for a small bulk and weight.

The main difficulty the air transport company had to cope with in establishing its services and in maintaining it was furnished by the extremely hot and humid climate. Hangars shipped from Europe deteriorated very quickly, and they had to be replaced with constructions made of native wood, with special provisions for ample ventilation. Owing to the great heat gasoline had to be stored under ground, and even so evaporation was abnormal. But the greatest trouble was caused by the plywood hulls of the flying boats, for the plies of the planking would promptly separate in the great dampness and so cause "incessant repairs." To remedy this situation, the hulls were sheathed with duralumin, but while this protected them to some extent against drift wood, it did not prevent the hull from rotting once water would seep between metal and wood. Finally the wooden planking was entirely discarded, and instead a steel shell was fixed to the wooden framework. This type of hull has given good service and weighs no more than a *dry* wooden hull—for in a soaked condition the plywood hull would often weigh some 200 pounds more.

The experience of this company—which operates since the summer of 1919—has convinced it that all-metal seaplanes are an absolute necessity in the tropics. It has now on order in France a new type of flying boat which, with the exception of the wing covering, is entirely built of metal, the hull being of aluminum bronze.

The Belgian flying boat service on the Congo river has gone through almost identical experiences as far as wooden construction is concerned, and their operators are also agreed that nothing but all-metal construction can withstand the great heat and humidity of the tropics. The Belgian colonial fliers furthermore suggest the use of air-cooled engines, folding wings, and a comparatively small type of seaplane which could easily be taken down for transport on the narrow-gage colonial railroads.

The French Aero Engine Competition

THE aero engine competition which the French air department will hold during 1924 is an event which should not go by without representative American participation. The character of the organizers as well as the large amount of prizes offered make it certain that this competition will acquire world wide prominence. It is obvious then that the engine which wins first prize, will acquire from that fact a very large amount of free publicity.

While the present depreciation of the franc reduces the value of the prizes offered by about 50 per cent, even so the winning manufacturer should make a handsome profit, if the payment of royalties on the purchased engine is considered.

During the last few years, American aeronautical engines, both air-cooled and water-cooled, have reached a very high degree of efficiency, as innumerable performances of aircraft testify. Hence on this score, there should not be the slightest hesitation to pit our own products against the best of those produced by Europe. The date of the competition is far enough removed to leave ample time for the preliminary study the design, construction and extensive testing of such an engine. It is, therefore, to be hoped that American engine manufacturers will not let this opportunity pass to show Europe the excellence of their products.

Recording Flight Maneuvers

THE National Advisory Committee for Aeronautics is to be congratulated upon the successful development of instruments by means of which it becomes possible to record the behavior of an airplane in flight. The ingenious manner in which this is accomplished—by means of an air speed meter, a load indicator and a control position recorder—is described in this issue.

The importance of this development is evident, not only for power flight but also, and perhaps even more so, for soaring, where every maneuver is still a kind of experiment.

Prospects of Contract Air Mail Services

Address by C. G. Peterson of the Wright Aeronautical Corp. At the Engineer's Club and the Flying Club of Baltimore

As I see the situation, the most helpful sign of the present time for commercial aviation is the attitude of Congress in realizing the necessity of having private contractors carry mail by air. There have been two bills presented on this subject, one by the Hon. Halvor Steenerson, Chairman of the Committee on Post Offices and Post Roads, and one by Hon. M. Clyde Kelly, of Pennsylvania, a member of that Committee. Let me quote from a prepared statement given by Mr. Kelly in May. "It has never been the policy of Congress or the Post Office Department to monopolize the carrying of mail matter by aircraft. It is believed that more rapid advancement can be made and more economical service given if private concerns are encouraged to perform this task of transportation." In looking at what can be accomplished by aerial transportation of mail, let us take a concrete example of a proposed air mail route between two cities—New York and Chicago. I will give you some actual figures on the quantity of mail now moving between those cities, the time which can be saved, and the costs of transporting this mail by airplane.

There are approximately 25 tons of first class mail sent daily from New York to Chicago. This includes the gateway mail at each end and considerable other mail matter, in addition to letters. There are on an average of 160,000 letters a day collected in New York City for delivery in Chicago City. This quantity does not include gateway mail at either end. The quantity of gateway mail is several times this amount. There are approximately 325,000 letters a day sent from Chicago to New York for delivery in New York City. The figures given are for letters and first class mail, and do not include other classes of mail of which there is a tremendous volume.

The following charts, prepared from the present actual train schedules, show in detail the time and quantity flow of this mail between New York and Chicago. These charts also include the lay-over time between the arrival of the train and the delivery. On these charts we have shown a mail plane "flight" paralleling each of the principal mail trains. It must be noted in this connection that the time of arrival and departure of most of these trains has not been set for the convenience of the Post Office Department, whereas if mail planes are operated their time of departure can be scheduled to meet the postal requirements.

Mail Train and Mail Plane Schedules

WESTBOUND

Train No. 43, the newspaper train, with three 60 ft. R.P.O. cars and five storage cars, leaves New York at 2:10 A. M., arrives in Chicago 24 hr. afterward, and its mail is delivered in Chicago at 9 A. M. of the second day, over 31 hr. after it leaves New York.

Flight No. 1 will leave New York at 2 A. M., arriving in Chicago at noon for delivery downtown by 2 P. M., saving one business day on 42,000 letters.

Train No. 19 with one 60 ft. R.P.O. car and one storage car leaves New York at 5:31 p. m., arriving in Chicago the next afternoon at 4 p. m., too late for delivery that afternoon, and the mail is delivered in Chicago 9 o'clock the following morning, 40½ hr. after it leaves New York.

Flight No. 3 will take the mail from train No. 19 at Erie, flying it to Chicago, to arrive at noon for distribution by 2 o'clock that afternoon, saving one business day on 42,000 letters.

Train No. 35, is a very heavy letter train, leaving New York at 8:40 p. m., with one 60 ft. R.P.O. car and 5½ storage cars, arriving in Chicago at 9 o'clock the next evening. Its mail lays over until the next morning and is delivered 35 hr. after leaving New York.

Flight No. 5 will leave New York at 8 p. m., arriving in Chicago at 0 a. m., for the first delivery in the morning, advancing 42,000 letters one business day.

Flight No. 7 is an additional plane leaving New York at the same time but carrying mail for West of Chicago. Flight No. 7 arrives in Chicago at 9 a. m. By using additional planes out of Chicago connecting with flight No. 7, the mail can be flown to arrive in St. Louis at 10 a. m., to be delivered by noon—to arrive in St. Paul at 11 a. m., to be delivered at 2 p. m.—and to arrive as far west as Kansas City by noon, to be delivered by 2 p. m., saving one business day on 42,000 letters.

Train No. 93 leaves New York at 9:26 a. m. carrying one 60 ft. R.P.O. car as far as Cleveland where it arrives at 4:35 the next morning for delivery approximately 24 hr. after it leaves New York.

Flight No. 9 leaves New York at 0 a. m., arriving in Cleveland at noon for delivery by 2 p. m., saving one business day on 42,000 letters.

EASTBOUND

Train No. 32 with one R.P.O. car and four storage cars leaves Chicago at 1:50 a. m., arriving in New York 26 hr. later, and its mail is delivered at 9 a. m. of the second day, over 30 hr. after it leaves Chicago.

Flight No. 2 will fly from Chicago at 3 a. m., arriving in New York at noon with 42,000 letters to be delivered downtown by 2 p. m., saving one business day on 42,000 letters.

Train No. 22 with one R.P.O. car leaves Chicago at 5:30 p. m. arriving in New York at 0:25 p. m., too late for delivery and its mail is delivered 9 a. m. of the second day, over 38 hr. after it leaves Chicago.

Flight No. 4 will fly from Erie at 6 a. m. with the New York mail taken from Train No. 22 which passes through Erie at 0:10, and Flight No. 2 will arrive at New York at 10 a. m. to be delivered downtown by noon, saving one business day on 42,000 letters.

Flight No. 0 will fly from Chicago at 12 o'clock midnight with the mail for Buffalo, Rochester, Syracuse, which has missed train No. 22 at 5:30 p. m. Flight No. 9 will arrive at Erie at 4:30 a. m., transferring its mail to train No. 22 which arrives in Syracuse at 10:45 a. m. for delivery at noon, saving one business day on 42,000 letters.

Train No. 28 with three R.P.O. cars carrying the heavy letter mail leaves Chicago at 11.15 p. m., arriving in New York at 7:10 a. m. of the second day, distributing its mail over 32 hr. after it leaves Chicago.

Flight No. 8 flies from Chicago at 11 p. m. arriving in New York at 8 a. m. the next morning for distribution 10 hr. after leaving Chicago, saving one business day on 42,000 letters.

Flight No. 10 is to forward mail flown from cities west of Chicago. This mail could be flown by air leaving Kansas City at 6:30 p. m.; leaving St. Paul, Minneapolis at 7:00 p. m.; leaving St. Louis at 8.00 p. m.; leaving Chicago at 11:00 p. m. arriving in New York at 8 a. m. the next morning with 42,000 letters advanced one business day.

Wright Co. Investigating Routes

Three routes are being investigated by our corporation for a flight from New York to Chicago. We are making an analysis of the weather conditions, the possibility of selecting good emergency landing fields, and the probability of density of traffic along these three alternative routes.

The first route is along the Southern boundary of New York State, through Binghamton, Elmira, Erie and Cleveland,

to Chicago. The second route is the present mail route through Bellefonte to Cleveland and Chicago. The third alternative route is somewhat longer but present data indicate that the all year around weather conditions will be considerably better. This route is known as the Southern Pennsylvania route through Reading, Harrisburg, Pittsburgh, Columbus, Dayton, and Indianapolis to Chicago. If this Southern Pennsylvania route is selected as a trunk airway for a New York-Chicago flight, the logical point of connection from Baltimore and Washington would be at Harrisburg, which has been selected as the probable location for a radio control station. It will probably be about an hour's flight from Baltimore and Washington to Harrisburg, so the westbound mail from Baltimore and Washington could be dispatched later than the time of the flights leaving New York. On eastbound mail, the mail for Baltimore and Washington could be flown from Harrisburg and arrive in Baltimore and Washington before the arrival of the through flights in New York.

These charts and the figures given show the actual time which can be saved by flying the mail, and give an idea of the quantity now being dispatched. The cost is the next important item, and in general since we have compiled these detailed figures we have been surprised at the moderate cost of such a service. We have based these costs on the contractor being able to make a four years contract with the Post Office Department.

Ground Organization Required

We have figured on the contractor establishing the aids to navigation required, and on his leasing an emergency landing field at every 18 or 20 miles along the route. At each landing field there will be a powerful beacon light, an illuminated sign, flood lights for landing, and an illuminated indicator giving the direction and velocity of the wind. At approximately every 150 miles we have figured on the contractor establishing a radio compass station.

Each plane will be equipped with a combined radio, telephone and telegraph set. An automatic sender on the plane will telegraph at short intervals the plane identification number. The two radio compass stations between which the plane is flying will chart the position of the plane from these intermittent signals. If the pilot should get off the course he will send an automatic message to the nearest radio compass station. The compass station will telephone to him the compass course to follow and the distance to get back on the course. By this method the pilot will not need to receive telegraphic messages, as the instructions will be sent to him by telephone. Furthermore, he will not need to use his telephone except when he desires. This leaves his attention undivided for maneuvering his plane except when he desires information.

We have figured on divisional points with shops and hangars approximately every 250 miles. At these divisional points the mail will be transferred to a fresh plane, fully serviced, and a fresh pilot. Inasmuch as a trunk air line from New York to Chicago, equipped for day and night flying, will spell the success or postponement of commercial aviation in this country, we consider it advisable for the radio compass stations and the divisional points to be under the control of the contractor so there may be no division of responsibility. We have figured on the contractor using new modern planes which will carry at least 1000 lb. of mail, with a cruising speed of 100 m.p.h., and a high speed of 20 or 25 miles faster.

Estimate of Operating Costs

We estimate that the cost of operating this service, based on a four years contract, flying four planes eastbound and four planes westbound daily will be approximately $1,863,000 per year. The four eastbound planes will expedite 210,000 letters a day, and the four westbound planes another 210,000 letters a day, or saving a business day on 420,000 letters a day. Flying on 310 business days a year would mean 130,000,000 letters per year, and the cost would be less than 1½ cents per letter. This works out that the total cost per mile flown is about $1.00, which is at the rate of one mill per mile per pound.

Now these figures indicate what can be reasonably expected in the future. But it must be remembered that in organizing as long a line as this, it will be inexpedient for either the contractor or the Post Office Department to undertake a contract of such magnitude as four planes each way daily. We have therefore prepared alternative figures on flying one plane each day each way. In making up this estimate we have left in all the costs of all the aids to navigation given in the larger estimate, including emergency landing fields, beacon lights, and radio compass stations, so that the costs given will cover day and night flying. We estimate that flying one plane each way each day between New York and Chicago will cost approximately $800,000, a year based on a four year contract. Based on a 1000 lb. load, the $800,000 yearly cost, plus 0 per cent, gives a rate of 1¾ mills per mile per pound or 4¼ cents per mile per cubic foot of cockpit mail space in a plane. On this basis of one round trip per day approximately 25,000,000 letters would be expedited yearly from New York right through to Chicago, and the cost per letter, $800,000 divided by 25,000,000 letters, would be a little over 3 cents per letter, that is if all the mail is *through* mail. If the flight is arranged so that *way* mail can be carried either between intermediate cities or advancing part of the mail from trains which had already carried it some of the distance, approximately 50,000,000 letters per year could be expedited, and the cost would be only about 1.0 cents per letter.

Let me quote again from Congressman Kelly, who says. "While the payment for the transportation by aircraft would practically equal the revenues, that fact should not be conclusive argument against the plan, when it is realized that the rural mail carrier receives two cents for every letter, paper or parcel delivered, more than the entire revenue received by the Post Office Department. It is believed a worthy project to continue the rural mail delivery for the promotion of the common welfare."

The Rate of Air Mail Postage

Another point to be considered is that both bills introduced by Chairman Steenerson and Congressman Kelly call for an increased rate of postage when the sender desires to make use of the air mail. Both bills, however, would allow the Postmaster General to send other mail in order to make up the full capacity of the plane. The use of this additional postage could be expected to grow rapidly and thus cut down the net cost to the Government. It must also be remembered that in preparing the costs of aerial mail, we have not deducted the present cost of transportation by rail. These detailed figures show that the cost of yearly operation is not excessive for the saving of a business day on millions of letters.

Both of the bills now before Congress give a maximum rate per pound per mile above which the Postmaster General will not be allowed to contract for. Unfortunately, the rates given in both bills are too low. Mr. Kelly says of his bill: "This measure has been approved by the Postmaster General with the proviso that the rate should be changed to 2 mills per pound per mile." We are heartily in accord with the desirability of either of these bills being passed with a rate of 2 mills per mile per pound, or its equivalent space rate of 5 cents per mile per cubic foot of mail compartment in the plane.

Unusual Speed Contest

At the flying meet recently held at Nice, France, much interest was elicited by an unusual speed contest between two of the fastest airplanes in the world. Sadi-Lecointe, the French champion, met Brack-Papa ,the famous Italian flier, the Frenchman being on a small Nieuport pursuit plane, fitted with a 300 hp. Hispano, while the Italian had a high-speed Fiat BR day bomber driven by a Fiat 12 cylinder 700 hp. engine.

The two champions were very closely matched. At the outset of the aerial race Brack-Papa got a slight lead and maintained it to the end, for he covered the course in his Fiat BR in 9 min. 42 3/5 sec., as compared with 9 min. 50 sec. for Sadi-Lecointe's Nieuport. The speed of the planes was about 190 m.p.h.

Showing an Aviator How He Flies

N.A.C.A. Develops Ingenious Instruments for Recording Behavior of an Airplane in Flight

A method of accurately recording what an aviator does in executing any maneuver in an airplane, and also for securing exact data on the performance of an airplane in flight, has just been devised by the aeronautical experts and pilots of the National Advisory Committee for Aeronautics.

Three special instruments have been perfected to record the speed of the airplane in the air, the loadings or changes in weight on the wings, and the movement of the controls by the pilot. Although fairly complicated themselves, the operation of these instruments is simple and mechanical, the recording being done by means of a photographic film. The results reveal for the first time a practical method of securing information in testing new types of airplanes, and for determining the ability and technique of a pilot. The last function of the instruments will be of great value to the pilots themselves and to instructors of novices, who are seldom able to recall just what they did with the controls at a certain point of a flight.

Three Instruments Record all Moves

The first instrument is an air speed meter, a device for recording the speed of the airplane through the air. A second, is used for recording variations in the loading on the wings in flight and the landing carriage when landing, taking off, or while running along the ground. In flying through a loop, for example, the pilot is sitting down hard as he goes up and again as he flattens out, but he is literally hanging in his belt at the top of the loop. It is these variations in load on the wings, due to the weight of the airplane and the aviator in the air that are recorded by this instrument and the weight on the carriage while on the ground. The third device, the control-position recorder, indicates the exact position of all the controls during any maneuver, or part of a flight. When the pilot gives his ship left rudder it is recorded in degrees, when he dives by pushing on his "stick," or pulls it back to lift the nose, these movements are shown on the record of the flight. After he lands, there is no argument as to what he did, for it is plotted from an automatic record. If one pilot reported that a certain airplane was not controllable, he could be checked up by having another pilot put the airplane through the same maneuvers, and then comparing the records of both pilots as delineated by this new instrument.

Instruments Act in Unison

These three instruments are synchronized to operate simultaneously, by means of a timing device which makes possible the coordination of the three records into a composite one available for study and analysis. The instruments themselves are not bulky and they do not interfere with the movements of the pilot or operation of the airplane. All the attention they require is the throwing of a switch, before a maneuver is begun and when it is completed, to set them all in operation and stop them.

When flight is completed, the photographic records with their delineations of the pilot's movements and the airplane's performance are taken to a laboratory, greatly enlarged for study, and then plotted on a single sheet so that a complete story of the particular flight or maneuver is ready for analysis.

The instruments developed have been employed at the Committee's free-flight laboratory at Hampton, Va., by Test Pilot Thomas Carroll, in studying ordinary and stunting maneuvers, including looping, rolling, the so-called Immelman turn and reverse turn. An extensive study of landing and taking off also has been made.

In his report on the tests, Pilot Carroll points out the importance of taking off and landing, which are the determining factors of the efficiency, and perhaps the longevity, of a pilot. Of the two, he says, landing is perhaps the more important for it is in this phase that the majority of accidents and damages occur. A paper on taking-off and landing by Maj. R. M. Hill, a British flying officer, is the only one known to have been published on these important maneuvers, and it was this treatise which inspired the tests and developments undertaken by the National Advisory Committee for Aeronautics in the country.

Keeping Tabs on the Pilot

Application of this research work is seen in designing new airplanes based upon performance tests, testing advanced and hitherto untried types, and study by instructors and pilots themselves. The author states: "It reveals to even the skilled pilot startling facts as to his technique." It is surprising to the flier," he says, "to see an accurate record of his every movement of the controls in the air and the fluctuation of the loading and air speed which have given him but fleeting impressions while he was in the air." Up to the time of these developments in recording instruments, designers and engineers had to depend upon the memories of the test pilots as to the performance of a particular airplane. The pilot's recollections were often vague and they frequently disagreed as to the same airplane, due perhaps to the personal equation. Today, however, a review of the finished chart by the flier enables him to recall his actions, the response of the airplane, and give a comprehensive report, which frequently adds much to the delineations on the chart.

Hitting a 4 1/2 Ton Blow

In one of his recent tests, Pilot Carroll made an especially bad, or "pancake" landing, by levelling-off about 6 ft. above the field, instead of a foot or so as is usually done, to see what

Fig. 1. General view of the control position recorder developed by the N.A.C.A.

effect on the airplane a loss of flying speed at that height would have. The record of the blow in vertical acceleration showed that he hit the ground with a force of four and a half times the weight of his airplane or a total force of about 4½ tons. Strangely enough, there were no dire results, except that one of the rubber shock absorbers broke. In careful and regular landings this force seldom exceeds one and a half to two times the weight of the airplane.

Further developments in perfecting these recording instruments include the addition of a recording device to show the progressive speed or revolutions of the engine, and another

device to record the actual force or power the pilot applies to his controls, that is, how many foot pounds he exerts in pulling his stick back or pushing it forward in a particular movement. This, it is said will indicate whether or not the pilot "drives" with a loose or tight rein, and whether he abuses his controls and the airplane itself.

Control Position Recorder Described

The mechanism of the Control Position Recorder developed by the N.A.C.A. is described by F. H. Norton in Technical Note No. 97, reproduced herewith.

The instrument as shown in Fig 1 consists essentially of the base plate and film drum mounting used on all the N.A.C.A. recording instruments. The constant speed driving motor (1) rotates the film clutch (2) at a speed of about 1 r.p.m. through worm gearing in the base. The motion of the

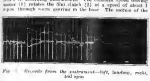


Fig. Records from the instrument—left, landing; right, tail spin

controls is transmitted to the instrument through the cords (3) which are wrapped around three drums (4). The drums are mounted on a horizontal screw and contain a spiral spring which keeps the cords wound tightly. Thus a 12 in. motion on the end of the cord is converted into a 3/16 in. lateral motion of the drum. This motion is transmitted by a system of levers (5) to the three mirrors (6) which reflect the light beam onto the film through lens (7) in the same way as with the other N.A.C.A. recording instruments. As three separate records are superimposed on one film it is necessary to have some way of distinguishing between them. This is accomplished by revolving slowly in front of two of the mirrors a sector shutter (8). One mirror therefore gives a continuous line, one dotted line, and one a dash line.

The cords can be connected directly to any convenient portion of the control system, but if it is desired to have a high degree of accuracy it is advisable to run small steel wires to the control horns so that any backlash in the control systems may be eliminated. If this is done a precision of ¼ deg. can be easily obtained, and this is quite sufficient for any ordinary work. The instrument is calibrated in place by setting the control surfaces to given angles and taking a short record on the film for each setting.

Some records taken by this instrument on a JN4H are shown in Fig. 2. Although they are not as clear as the original film the different records can be distinguished. The curves are usually replotted by measuring the distances on the film from the zero line and then multiplying by the calibration constant to give the true angle in degrees. These angles are then plotted against a time base so as to agree with the records from other instruments. The record of the landing shows the three-second vertical timing lines placed on the film by a light in the instrument case which is connected, together with timing lights in other instruments, to an electric chronometer.

The instrument has been used mainly by the National Advisory Committee for Aeronautics in the study of stability, controllability and maneuverability. For this work a knowledge of the position of the controls is essential but the method formerly used for reading the angle visually was too slow and inaccurate for most of the work. This instrument will obtain more data in a few minutes' flight than could be obtained before in flights of many hours, so that the cost of this kind of research has been greatly reduced by this means. Another use of this instrument is for the study of control movements in various types of maneuvers. This is quite important as the pilot cannot remember exactly how he moves his controls in order to execute a given stunt. It would also be of considerable value to check up on new pilots and to show them how their execution of a maneuver differs from that of a skilled pilot.

Trophy Races and Aeronautical Patents

The Aero Club of America is in receipt of letters from the Wright Aeronautical Corp. and the Curtiss Aeroplane & Motor Corp. stating arrangements for the use by foreign airplanes of their airplane and motor patents if these planes are sent to the United States to compete in the various trophy races.

These letters are as follows:

WRIGHT AERONAUTICAL CORPORATION
Paterson, N. J. U. S. A.
April 17, 1922

Aero Club of America,
New York City
Gentlemen:

We are in receipt of a letter from the Curtiss Aeroplane & Motor Corp. suggesting that free hospitality be issued broadcast to foreign airplanes for the use of the Wright airplane patents if these planes are sent to the United States to compete in the various trophy races. We are of course perfectly willing to allow such free use of the Wright patents in all cases that we can foresee at present, but we do not know what such a broadcast statement might lead to. We do not therefore think it advisable to handle this matter in such a loose way.

From time to time when races are announced in the United States, to be held under the auspices of the Aero Club of America, it is customary for the Aero Club to require entries to be made by a certain date. When such entries are made to the Aero Club, if the Aero Club will forward us the data on the entries that we require from other applicants for a license to use the Wright airplane patents, we should be very glad to take prompt action thereon. This will involve no delay, will protect the interests of our other licenses and be just as satisfactory as a more broadcast statement on our part.

The information that should be given will be the name of the manufacturer of the plane, the material for construction, the make of engine, the type of plane (monoplane, biplane, etc.) and the race for which the entry is to be made.

Yours very truly,
WRIGHT AERONAUTICAL CORPORATION
(signed) C. G. Peterson

CURTISS AEROPLANE & MOTOR CORPORATION
Garden City, L. I. New York
April 18, 1922

Aero Club of America,
New York City
Gentlemen

We have a copy of a letter from the Wright Aeronautical Corp. to the Aero Club of America, dated April 17, in connection with the use of Wright patents for planes brought into this country for important competitions during 1922.

This Corporation will arrange for the use by foreign airplanes of its airplane and motor patents, in the same manner as suggested by the Wright Aeronautical Corp. and asks that similar information be supplied to this corporation in the manner suggested by the Wright Aeronautical Corp.

Very truly yours,
CURTISS AEROPLANE & MOTOR CORPORATION

The Organization of Airports

Information Division, Air Service Issues Revised Specifications and Rules for Ground Organization

The Information Division of the Army Air Service has, ever since the Armistice, exerted a consistent effort to have a uniform ground organization accepted throughout the United States, and with this end in view it has elaborated specifications covering the building of airports, their identification and the establishment of ground markers. The original specifications, published in AVIATION *about a year ago, have since been revised, in particular with regard to the identification marker, as may be seen from the official memorandum which follows.* EDITOR.

History of development as far back as we have information shows that the means produced were in all cases dependent upon and resulting from existing necessity. Transportation and its development serves as a most striking example in this regard. Centuries ago in the use of animal transportation from point to point there resulted a means for the housing and feeding of the animals at the various stopping points and community centers. This through the ages resulted in what is known in this generation as the "livery stable" and "feed store." Parallel to this primitive travel on land we find that water travel, in the same way, developed docking facilities and loading and unloading facilities, the latter with the advent of the power driven watercraft, including fueling facilities. The development of transportation by rail brought forth the railroad terminal, which as we know it today consists of stations, yards (both for switching and for fueling) and roundhouses with facilities for maintenance and repair. Then there is the recent development of the automobile as a means of transportation, and this means in its broad use today has given us what we know as the garage and the filling station.

It is perfectly evident that any one of the above mentioned means of transportation could not be brought to a successful development without the proper establishment of adequate terminal facilities, and therefore if aviation is to be brought to a successful establishment as a means of transportation attention and support must be given to the establishment of adequate terminal facilities for the aircraft being used.

A glance at the development of any one of the above means of transportation and the accompanying growth in population and industry of the terminal centers incident thereto, shows us very clearly how closely the two are interdependent one upon the other. In the same manner the growth of coastal and river communities has been found to be most closely related to the harbor and docking facilities for the watercraft in use. Therefore, is it unreasonable for us to assume that from the standpoint of aircraft this development and this growth will result interdependently one upon the other?

The Landing Field

This brings us to the point that municipalities, should they desire to prepare themselves in an adequate manner for the development of aviation of a commercial nature, both in its application as a means of transportation and with reference to its utility in a community, must as a primary step establish adequate facilities for the development of an airport. The consideration to be given in this regard must be made to cover the following points:

(a) The effecting of a proper organization to represent the municipality in all matters relating to the establishment, the operation and maintenance of the facility concerned.

(b) The formulating of a definite policy as to the establishment, the operation, and the maintenance of the field.

(c) The actual obtaining and construction of an airport.

The benefits to be derived from the establishment of a suitable airport by a municipality may be covered from two standpoints: first, from the standpoint of the proper support being given to commercial aviation, and second, from the standpoint of its share of contribution to adequate preparation for national defense.

The building of an adequate airport immediately places the city or community so doing in the system of commercial aviation in the United States. The city or community is then available as a terminal or stopping point for aircraft and the benefits of a rapid yet comfortable means of transportation is available both to or from the airport.

Air Mail hangar with steel bascule door, at Reno, Nev.—an example of up-to-date airport equipment

How an Airport Should be Built

Whether the importance of a community warrants the building of a thoroughly modern air terminal, or whether a minor

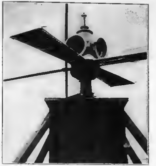
source, it is essential for the success of air navigation that all airports conform in certain particulars to given standards. This standard has been worked out in specifications which follow.

Location—The location of an airport should be so selected as to bring it within reach of ground transportation facilities, for the aerial transportation of passengers and merchandise is closely interlinked with these conveyors of commerce. The site should be capable of expansion in case of future necessity.

Size—While the size of airports depends upon many problems peculiar to each city, there is a minimum size for airports which are intended to take care of all types of airplanes and airships used today, now under construction, or contemplated, under all conditions of traffic and weather. The minimum size should allow a clear unobstructed area of about 900 yd. along the direction of the prevailing wind, if not in all directions. Such a field would allow a moderate insurance of airplanes and property in the case of engine failure on take-off. Smaller fields, allowing about 600 or 700 yd. of unobstructed area, will permit the average pilot, in any present type of airplane, to land and take-off without difficulty provided no engine failure occurs. The dimensions given may seem excessive, and many planes have landed safely and operated from smaller fields. However, the point to be considered is the saving of life and property.

The usefulness of small fields is determined by the presence or absence of obstacles around the field which prevent a clear approach for landing. An obstacle about 100 ft. high, for instance, would make at least 700 ft. of a landing field unavailable for landing. Thus, the available length of the runway should be computed by subtracting seven times the height of obstacles that materially obstruct the approach to a landing field from the total length or breadth of the field.

Shape—It must be borne in mind that airplanes and airships must be landed heading directly into the wind. Thus, the best shape for a landing field is, roughly, a square, in that it allows landings or taking-off in any direction. "L" shape and rectangular fields are only slightly less useful, mainly because they restrict to a certain degree the number of angles of possible approach for landings.



P & A. Photos

Automatic landing T at Croydon airport illuminated for night flying it is visible from a distance of 12 miles

Wind direction and wind speed indicator used in a German airport during the war

Character of Ground—The ground should be firm under all weather conditions, sodded if possible on account of dust, which is not only disagreeable but injurious to the working parts of the motor. The surface should be level and fairly smooth. Ditches or deep furrows will cause considerable damage, if not wreck an airplane.

Approaches—Obstacles surrounding fields, such as high buildings, telephone and telegraph, or high tension transmission lines, trees, etc., very materially decrease the amount of landing runway, as shown in preceding paragraphs. Where only trees or telegraph lines obstruct the approaches, trees can be cut down and telegraph lines placed under ground in conduits.

Markings—When a field has been set aside and been inspected by a pilot, preferably an Army Air Service pilot, familiar with the requirements of modern types of airplanes, it should be marked with a landing circle, this marker to be placed in the center of the landing area. It should be a large white circle, 100 ft. in diameter, with a band 4 ft. wide, constructed so as to be flush with the ground, so that in no way will it interfere with the rolling of an airplane over it. These circles can be best constructed by digging a shallow trench about 4 to 5 in. deep, and filled with crushed stone or other material. Planking can also be used. The circle should always be kept white with lime or some other compound for this purpose.

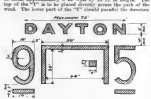
Within the landing circle, direction landing markers should be placed to show the best runways and aproaches for landing and taking-off. The markings should consist of panels 15 ft. long by 3 ft. wide, and should parallel the direction of the least obstructed approaches. They should be flush with the surface of the ground, so as not to obstruct the rolling of an airplane over them. They also should be kept white with lime or some other material.

The international identification marker should be placed in the northwest corner of the field. See attached specifications and sketch.

All markings should be kept white, so as to be seen easily at a great distance in the air.

A wind indicator, such as the standard wind cone, should be placed in one corner of the field, about 30 ft. off the ground, or on the hangar if there is one.

At fields where the wind direction indicator has not been erected, a cloth "T" should be placed on the field to indicate the direction of the wind. This "T" should be made of strips of cloth, approximately 3 ft. wide by 15 ft. in length. The top of the "T" is to be placed directly across the path of the wind. The lower part of the "T" should parallel the direction



Ground marker adopted by the Air Service for identification of localities

of the wind in the direction in which it is blowing, so that a plane about to land will land from the bottom of the "T" toward the top, or directly into the wind. A smudge fire is also a very excellent type of wind indicator.

Accommodations—An airport should have communication by telephone with nearest city or town, transportation facilities, gasoline, oil and sundry supplies. Hangars and shops will be needed as the use of the field develops.

Explanation of Diagram and Identification Number

The international identification marker is to be placed on the right hand side of every railroad track where it enters the town, and will be an invaluable aid to aerial navigation. The following will best illustrate the value of such markers.

A pilot has become lost or bewildered because of a low fog, or otherwise, and flies in some direction until he picks up a railroad track. He follows this railroad until he sights one of the identification marks, which is located on the right hand side of the track and on the outskirts of the city. He immediately locates himself and will not have to pass over the heart of the city, thus endangering his own life and the lives of others by hitting some high tower or building hidden by a low fog.

Material for marker should consist of heavy stones (cobblestones suggested) and must be whitewashed frequently so that the diagram can be readily seen from a great distance.

The railroad right of way or vacant lot adjacent to the railroad would be the logical location for the diagram. In the case of one railroad the diagram will be placed on the right hand side of the track, and on each side of the town so that it can be read by the flier from his right as he approaches the town. Two railroads would necessitate the laying out of four diagrams. In other words, there should be two diagrams for each railroad, so that a flier, following any railroad into the city, can locate himself immediately. This, of course, is the ideal, but if it is impracticable at this time to construct more than one of these diagrams, preference should be given to the north or east side of the town.

Before attempting to understand the following explanation, it is suggested that the reader procure a map showing the lines of latitude and longitude and location of his town. The open sided rectangle represents the lower or upper half of the rectangle formed on the map by the lines of latitude and longitude. The dot inside represents your town and its relative location on the map. The numbers indicate the latitude and longitude of the south and west sides of the rectangle.

For example, if your town is in the rectangle whose south and west sides are formed by the lines 39 deg. latitude, and 80 deg. longitude respectively, then your diagram will have number 9 placed on the left and 0 on the right, the latitude number always being placed on the left and the longitude number on the right. The last number in each case is considered sufficient, because the points 29 and 70 or 49 and 90 are approximately 600 miles away on either side, and the aerial navigator will not be confused as to their identity for he generally knows within much less than 600 miles where he is.

Your town being in the upper or lower half of the rectangle is indicated accordingly, and the dot is placed relative to the location of your town on the map.

The balance of the drawing is self-explanatory. The name of the town is laid out at the top or bottom of the rectangle,

Identification marker in the vicinity of Washington, D. C.

depending on the case in hand. Letters should not be less than 4 ft. in height, for they must be discernible at a great distance.

On every landing field of a permanent nature the international identification marker should be installed. The correct position for it is in the northwest corner of the field. For dimensions see attached sketch.

Boosting American Aircraft In China

The Far Eastern Review, a financial, engineering and commercial monthly, published at 5 Jinkee Road, Shanghai, China, by George Bronson Rea, has at various times in the past lent considerable assistance to American aviation in disseminating educational information in the Orient.

In the March issue of this publication appears a review of commercial aviation in the United States during 1921, which was furnished by the Aeronautical Chamber of Commerce. In notifying the latter of this publication, Mr. Rea states:

> "*****May I also impose upon your good nature to get in touch with the various aircraft manufacturers of the United States, in the hope that they will send us any of the material they have gotten together, with photographs, if convenient. You might ask them to send us photographs and short descriptive articles of all the new aircraft, together with accessories for the same."

Notices to Aviators

Issued by Hydrographic Office, U. S. Navy

The following landing fields * have been reported to the Office of the Chief of Air Service since Jan. 1, 1922.

Connecticut

Stamford—Latitude 41° 03' N., longitude 73° 32' W.
Halloween Park, emergency, 2½ miles south of town.

Florida

Apalachicola—Latitude 29° 44' N., longitude 84° 58' W.
Landing for seaplanes only.

Green Cove Springs—Latitude 29° 20' N., longitude 81° 41' W.
Landing for seaplanes only.

Palatka—Latitude 29° 19' N., longitude 81° 38' W.
Landing for seaplanes only.

Georgia

Thomasville—Latitude 30° 53' N., longitude 83° 58' W.
Spence Field, municipal, 1100 by 350 ft., good in wet weather, marked by a T within a circle, between highway and railroad, altitude 275 ft.

West Rome—Latitude 34° 07' N., longitude 85° 06' W.
Reported by the National Aircraft Underwriters Association; no data.

Illinois

Ashburn (Chicago)—Latitude 41° 45' N., longitude 87° 40' W.
Aero Club of Illinois Field; 10 miles from Congress Hotel, one mile square, three hangars, soggy when wet, supplies and service by Ralph C. Diggins Company Flying School. (See Notice to Aviators 3 (24) of 1922.)

Beardstown—Latitude 40° 01' N., longitude 86° 25' W.
For seaplanes only; difficult landing in cross winds; flying boat anchor must be used, fuel ordered in advance.

Cairo—Latitude 37° 00' N., longitude 89° 11' W.
For seaplanes only, flying boat anchor must be used; fuel ordered in advance; Chamber of Commerce will cooperate.

Indiana

Anderson—Latitude 40° 05' N., longitude 85° 40' W.
32 acres rented and operated by E. B. Bridges.

Kentucky

Barbourville—Latitude 36° 51' N., longitude 83° 53' W.
Commercial field and flying school.

Lexington—Latitude 38° 03' N., longitude 48° 30' W.
Race track field.

Maine

Auburn—Latitude 44° 06' N., longitude 70° 15' W.
Northeast Airplane Co. Field; small.

Maryland

Cambridge—Latitude 38° 35' N., longitude 76° 04' W.
Seaplanes only.

Chestertown—Latitude 39° 12' N., longitude 76° 04' W.
Seaplanes only.

Crisfield—Latitude 37° 59' N., longitude 75° 52' W.
Seaplanes only.

Easton—Latitude 38° 46' N., longitude 76° 05' W.
Seaplanes only.

Ocean City—Latitude 38° 20' N., longitude 75° 06' W.
Seaplanes only.

Oxford—Latitude 38° 41' N., longitude 76° 11' W.
Seaplanes only.

Salisbury—Latitude 38° 22' N., longitude 75° 36' W.
Seaplanes only.

Massachusetts

Auburn—Latitude 42° 12' N., longitude 71° 49' W.
Emergency, 900 by 1000 ft., stone wall south and east.

Cliftondale—Latitude 42° 27' N., longitude 71° 01' W.
6 miles north of Boston, on race track. Land east and west on north track only.

Danvers—Latitude 42° 34' N., longitude 70° 56' W.
Emergency; 30 acres, square, north of reservoir, along road.

Dorchester—Latitude 42° 18' N., longitude 71° 03' W.
Franklin Field Playground; dangerous; 50 acres, near Boston; emergency only.

Greenfield—Latitude 42° 37' N., longitude 72° 35' W.
The Meadows Field; ½ mile square; 3½ miles out along road, 2 miles from Deerfield.

Hingham—Latitude 42° 14' N., longitude 70° 53' W.
Emergency field, 1⅛ miles south of Boston, 1800 by 700 ft.

Nantasket Beach—Latitude 42° 17' N., longitude 70° 52' W.
Kenberma Park Field, L shaped, near beach, marked with circle, service and supplies by American Aerial Corp. of Boston.

North Beverly—Latitude 42° 33' N., longitude 70° 53' W.
Emergency, 25 acres, southeast of reservoir, 3 miles out.

Revere—Latitude 42° 24' N., longitude 71° 00' W.
Field of the Lynnway Aircraft Corp.; 30 acres, hangars and supplies; along the boulevard between Revere Beach and Lynn.

South Sudbury—Latitude 42° 22' N., longitude 71° 27' W.
Field of American Aerial Corp.; 15 miles west of Boston; 25 acres, along highway at railroad crossing; marked by the letter A inside a circle, service and supplies.

Michigan

Alpena—Latitude 45° 05' N., longitude 83° 27' W.
For seaplanes only; moorings not so good on account of town being on open lake; flying-boat anchor must be used; fuel ordered in advance.

Harbor Springs—Latitude 45° 25' N., longitude 85° 00' W.
No data.

Holland—Latitude 42° 45' N., longitude 86° 05' W.
Seaplanes only, good landing on lake; flying-boat anchor must be used.

Mackinac—Latitude 45° 45' N., longitude 84° 45' W.
Seaplanes only; mooring hazardous except in smooth weather.

Manistique—Latitude 45° 58' N., longitude 86° 15' W.
Reported by the National Aircraft Underwriters Association; no data.

Manistee—Latitude 44° 14' N., longitude 86° 22' W.
Seaplanes only, good in open lake if water is smooth; must be taxied between two breakwaters into small harbor; flying-boat anchor must be used.

Muskegon—Latitude 43° 13' N., longitude 86° 15' W.
Seaplanes only; shallow water and rocks; mooring facilities good.

Petoskey—Latitude 45° 22' N., longitude 84° 58' W.
Seaplanes only; flying boat can be tied to dock; anchor must be used.

Port Huron—Latitude 42° 58' N., longitude 82° 24' W.
Seaplanes only; mooring facilities not good on account of current.

Saginaw—Latitude 43° 28' N., longitude 83° 58' W.
Fair grounds; ½-mile track; 2 miles east of town; clear approach.

Traverse City—Latitude 44° 45' N., longitude 85° 38' W.
Seaplanes only; city on open lake; weather must be watched.

* The full list issued by the Hydrographic Office in Notice to Aviators No. 4 (1922) contains a much larger number of landing fields. Owing to restrictions of space it is possible to reproduce here only the information relative to fields situated east of the Mississippi river. The data concerning landing places along the Atlantic coast will be found of value in connection with the list of seaplane landing places issued by the National Advisory Committee for Aeronautics, which was printed in the May 1, 1922 issue of AVIATION. Additional information on landing places for seaplanes on the Atlantic coast appeared in Notice to Aviators No. 10 (1921) together with mention of a seaplane route across Florida from Atlantic ports to Gulf ports. EDITOR.

Mississippi

Aberdeen—Latitude 33° 47′ N., longitude 88° 27′ W
Fair Grounds, in race track, emergency
Laurel—Latitude 31° 42′ N., longitude 80° 02′ W
Municipal fair grounds; 830 by 310 ft, in ½-mile track; Madison Station.
Natchez—Latitude 31° 34′ N., longitude 91° 20′ W
Seaplanes only; landing facilities good, fuel ordered in advance

New Jersey

Brookside—Latitude 40° 47′ N., longitude 74° 35′ W.
Large unplowed field 58 miles from Mineola, on the railroad. Field of the Eagle Flying Corps; 1500 ft. square, 3 miles from town, east of railroad crossing, red hangar on west; good when wet, mine shaft northeast, altitude 600 ft
Elizabeth—Latitude 40° 40′ N., longitude 74° 14′ W
Emergency No data.
Newport—Latitude 39° 18′ N., longitude 75° 10′ W
Reported by the National Aircraft Underwriters' Association, no data.
Port Murry—Latitude 40° 47′ N., longitude 74° 55′ W
67½ miles from Mineola, suitable for emergency landings, supplies.
Ridgewood—Latitude 40° 58′ N., longitude 74° 07′ W
Rouciere Field, commercial, passenger carrying
Seagirt—Latitude 40° 07′ N., longitude 74° 02′ W.
Camp Edwards Field; 500 by 2000 ft, along ocean, between barracks and road, very good
Spring Lake Beach—Latitude 40° 10′ N., longitude 74° 02′ W
Emergency, along coast and west of bridge crossing inlet; commercial.
Wrightstown—Latitude 40° 02′ N., longitude 74° 37′ W
Camp Dix, 15 miles southeast of Trenton, West Point Cadets in training, emergency

New York

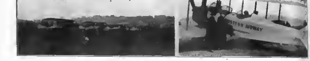
Alexandria Bay—Latitude 44° 20′ N., longitude 75° 55′ W
Seaplanes only; good landing facilities, use flying boat anchor
Batavia—Latitude 43° 00′ N., longitude 78° 11′ W
Emergency only, fair grounds; poor
Canton—Latitude 44° 36′ N., longitude 75° 10′ W
Fair grounds; ½-mile track, good field; ½ mile northwest of town.
Cornwall-on-Hudson—Latitude 41° 25′ N., longitude 74° 00′ W.
Military Academy Field; 500 by 100 yd, good when wet
Geneseo—Latitude 42° 48′ N., longitude 77° 50′ W
Emergency field 1500 by 1800 ft, two miles north of town; good when wet.
Lake George—Latitude 43° 26′ N., longitude 73° 42′ W.
Seaplanes only; excellent landing facilities, aeromarine Santa Maria.
Newburgh—Latitude 41° 30′ N., longitude 74° 00′ W
Seaplanes only, buoy placed in river by Chamber of Commerce
Rye—Latitude 40° 39′ N., longitude 73° 41′ W.
No data.
Tupper Lake—Latitude 44° 13′ N., longitude 74° 28′ W
Osley Farm Field, 500 by 1500 ft., good, fenced, along road

Long Island

Gravesend Bay—Latitude 40° 34′ N., longitude 74° 00′ W
Fair grounds, near Coney Island, mile track, ideal
New Dorp—Latitude 40° 34′ N., longitude 74° 06′ W
No data
Plum Island—Latitude 41° 10′ N., longitude 72° 12′ W.
Fort Terry Parade Ground, across Long Island Sound.
Sayville—Latitude 40° 45′ N., longitude 73° 05′ W
Emergency field, Sayville radio towers near.
Southampton—Latitude 40° 54′ N., longitude 72° 25′ W
Emergency; near beach, also at West Hampton.
Westbury—Latitude 40° 45′ N., longitude 73° 35′ W
Roosevelt Field, the best on Long Island, 3000 ft. square, four hangars.
Woodbury—Latitude 40° 50′ N., longitude 73° 26′ W.
Webb Field, old Government field, ideal

North Carolina

Bellhaven—Latitude 35° 32′ N., longitude 75° 37′ W
Seaplanes, no data
Columbia—Latitude 35° 55′ N., longitude 76° 14′ W
Seaplanes only; no data.
Danville—Latitude 36° 01′ N., longitude 79° 38′ W
Emergency field, on hilltop
Edenton—Latitude 36° 04′ N., longitude 76° 35′ W
Seaplanes only, no data
Elizabeth City—Latitude 36° 18′ N., longitude 76° 13′ W.
Seaplanes only, no data.
Hamlet—Latitude 34° 58′ N., longitude 70° 39′ W
Emergency fields in open country around
Hertford—Latitude 36° 11′ N., longitude 76° 28′ W
Seaplanes only, no data.
Kinston—Latitude 35° 15′ N., longitude 77° 34′ W
Hill Field, 500 by 1000 ft., south of river, north of railroad.
Monroe—Latitude 35° 00′ N., longitude 80° 32′ W.
Reported by the National Aircraft Underwriters Association, no data.
Newbern—Latitude 35° 06′ N., longitude 77° 02′ W
Field of the Acme Film Co.; 150 by 700 ft.; good when wet.
Oriental—Latitude 35° 02′ N., longitude 75° 41′ W.
Seaplanes; no data.
Plymouth—Latitude 35° 52′ N., longitude 75 ° 44′ W
Seaplanes, no data.
Swan Quarter—Latitude 35° 25′ N., longitude 76° 20′ W
Seaplanes only; no data.
Washington—Latitude 35° 33′ N., longitude 77° 03′ W
Seaplanes only, no data.
Wrightsville Beach—Latitude 34° 12′ N., longitude 77° 48′ W
Seaplanes only, no data.



Left—Five airplanes of the Western Airway fleet, lined up for inspection at Marina Field, San Francisco, previous to their start for Los Angeles. Right—Close-up view of one of the ships

Ohio

Alliance—Latitude 40° 55′ N.; longitude 81° 06′ W
Country Club, emergency field
Canton—Latitude 40° 48′ N., longitude 81° 22′ W
Reel Estate Company Field, 500 by 1500 ft., bordered by streets
Findlay—Latitude 41° 03′ N., longitude 83° 37′ W
Emergency; near old fair grounds; 1000 by 3000 ft.; ideal
Fremont—Latitude 41° 20′ N., longitude 83° 06′ W
Christy Farm Field, 700 by 1200 ft., ideal
Hamilton—Latitude 39° 23′ N., longitude 84° 32′ W
Emergency; fair grounds.
Ironton—Latitude 38° 31′ N., longitude 82° 40′ W.
Field of the Rafnes Flyers (Inc.), flying instruction
Kenton—Latitude 40° 38′ N., longitude 83° 36′ W
Emergency, fair grounds, ½-mile track.
London—Latitude 39° 53′ N., longitude 83° 26′ W
Field of the London Aero Club (Inc.), 1500 ft. square, hangar, supplies.
Ravenna—Latitude 41° 10′ N., longitude 81° 15′ W
Willard Brady Field; 780 by 1200 ft.
Steubenville—Latitude 40° 22′ N., longitude 80° 35′ W
Emergency, country club, 1800 by 300 ft
Youngstown—Latitude 41° 05′ N., longitude 80° 37′ W
Olds Farm Field, 1400 by 1000 ft.; near country club, ideal.
Zanesville—Latitude 39° 57′ N., longitude 82° 00′ W
Emergency; 900 by 650 ft.; also ½ mile track.

Pennsylvania

Bethlehem—Latitude 40° 37′ N., longitude 75° 23′ W
Emergency, 1000 by 1500 ft., 4 miles south of town
Dauphin—Latitude 40° 23′ N., longitude 76° 57′ W
Emergency, 50 acres
Hatboro—Latitude 40° 10′ N., longitude 75° 56′ W
Commercial, 15 miles north of town; along York Road
Irwin—Latitude 40° 21′ N., longitude 79° 41′ W
Field of the Irwin Aircraft Corp., 20 miles east of Pittsburgh, hangar
Mechanicsburg—Latitude 40° 13′ N., longitude 77° 03′ W
Municipal; 30 acres.
Williamsport—Latitude 41° 17′ N., longitude 71° 04′ W.
McCormic Motor Car Co.'s Field; 100 acres, along river; hangar

Rhode Island

Pawtucket—Latitude 41° 54′ N., longitude 71° 22′ W
Emergency, no data.
Quonsett—Latitude 41° 35′ N., longitude 71° 25′ W
Emergency, state property; on bay, unlimited space
Sandy Point—Latitude 41° 40′ N., longitude 71° 25′ W
Emergency; 5 miles east of Greenwich

South Carolina

Beaufort—Latitude 32° 36′ N., longitude 80° 40′ W.
Seaplanes only, no data.
Duewest—Latitude 34° 20′ N., longitude 82° 24′ W
Aerial mail station, experimental station.
Georgetown—Latitude 32° 22′ N., longitude 79° 17′ W
Seaplanes only, no data.

Tennessee

Clarksdale (Memphis)—Latitude 35° 00′ N., longitude 90° 00′ W
Field of the Memphis Aerial Co.; near country club; hangars, etc.
Jellico—Latitude 36° 36′ N., longitude 84° 00′ W
Municipal, 60 acres; ideal, hangars, etc.

Vermont

Brattleboro—Latitude 42° 51′ N., longitude 72° 07′ W.
Emergency, good, marked with 100-ft. circle.
St. Johnsbury—Latitude 44° 25′ N., longitude 72° 01′ W.
Emergency, along river.

Virginia

Cape Charles—Latitude 37° 07′ N., longitude 75° 50′ W.
Seaplanes only; no data.

West Virginia

Bluefield—Latitude 37° 15′ N., longitude 81° 13′ W.
Aero Club Field; aerial taxi lines.
Huntington—Latitude 38° 26′ N., longitude 82° 27′ W.
Commercial Flying Field.

The Latest Air Express of the London-Paris Service

(c) Kadel & Herbert

The DH34 (450 hp. Napier "Lion" engine) of the Daimler Airway Co.—which carries nine passengers and pilot at a cruising speed of 105 m.p.h., with fuel for 3½ hr. Wing area 590 sq. ft. Maximum permissible weight 7200 lb

The Life of Some Airplanes

The life of an airplane, that is, the span of time within which a ship remains airworthy and ready for service, is a subject which constantly recurs in discussions of commercial aviation. Many cases are cited to show that the estimates furnished by aeronautical lecturers, although they vary a good deal, have frequently been exceeded in practice. For instance, the experience of the Paris-London airways shows that many airplanes remain in actual service under exacting conditions for well over one year or more, and that they outlive many an engine. Hard landings, which weaken the structure, are chiefly responsible for terminating the practical usefulness of an airplane, although to all outward appearances she may still seem airworthy.

The "Santa Maria"

Seaplanes suffer far less in this respect because they operate over water, which affords everywhere a reasonably level landing place and at the same time a fairly elastic medium. The record of the Aeromarine Airways, and in particular of their flying boat Santa Maria, which will shortly have completed two years in constant service, is illuminating in this respect. This ship has now flown a total distance of some 26,000 miles, in the course of which it has been employed on the Key West to Havana service, on sightseeing tours around New York, on various charter flights to the Bahamas, and on a circumnavigation of the eastern United States by way of the Hudson, the Great Lakes, the Mississippi, and the Gulf and Atlantic coasts—without ever meeting with anything like a serious accident. The other F5L's of the Aeromarine Airways, while having flown a less distance individually than the Santa Maria, are giving just as effective service and were put in commission at about the same time. The only ship the company ever lost—and it is well to emphasize this in view of the publicity an aircraft obtains from the press when it is overdue, and the short notice it gets when the ship and its occupants are safely located—was the Pinta which was torn from her moorings by a storm, there being no crew on board, and was thrown upon a rocky beach, which wrecked her career. It will thus be seen that, given suitable operation and maintenance, the life of seaplanes is by no means so short as theoretical dissertations would make it appear. This is a point well worth noting when the economic aspects of public air transport are discussed.

With regard to the effective life of land machines we have less specific data on hand and would welcome information from readers concerning their experience. There is however the case of a two-seater tractor biplane designed by O. Edward Barnhart which is extremely interesting.

A Hardy Pre-War Tractor

This ship was designed at San Diego in 1915, and built to the order of Ledyard Blake the following year, only six weeks elapsing from the time construction began to day of the trial flight, May 15, 1916. In the following June the machine was test-flown by Edward Oliver and Eddie Mussich, then Army and Navy Instructors, respectively, and a speed range of from 45 to 95 m.p.h. and a climb of 4500 ft. per minute were obtained with the Curtiss OX2 85 hp. engine with which she was fitted. The ship was then used in exhibition work at Ocean Park, Venice, and other points in California. In June, 1917, she was sold to Dr. C. E. Holgate and Ralph Newcomb, who refitted her with a Curtiss Model O, 75 hp. engine, and used her for passenger carrying and dual instruction work until April, 1918, when the war requirements caused her owners to suspend operations. A Miller 100 hp. engine had just been installed in the ship, and as civil flying was then prohibited, a government pilot, Lawrence Brown, was operating her Sundays at Venice, Calif.

In July, 1919, the Barnhart tractor again changed hands, her new owner being A. H. Hayes of Pasadena, who re-engined her with a Curtiss OX5 model and used her for joy-riding in Southern California in company with Frederic Whitney, who taught Mr. Hayes to fly. Piloted by Mr. Whitney, the ship won the free-for-all race at Venice, on Feb. 22, 1920, outflying and outclimbing all other ships present, some of which had twice the horsepower. In the following September Mr. Stevenson purchased the machine and entered her in the Long Beach meet held Christmas week of 1920. Piloted by W. Timm, the Barnhart tractor took third place in the Semi-Free-For-All Race (which included ships fitted with Hispano-Suiza and Hall-Scott 125 hp. engines) although she had not had her covering renewed and her engine was only turning 1350 r.p.m.

During all this service the only replacements that were effected consisted of a tail skid and a new landing gear, not counting of course the five engines with which the ship was subsequently fitted. (Mr. Hayes had two OX5's for her use.)

Following are the principal characteristics of this machine, which is now owned by Ralph Short of the Escondes Co. of Los Angeles: span 34 ft. (top), 26 ft. (bottom); overall length 22 ft.; gap and chord 5 ft. each; total wing area 295 sq. ft. According to latest accounts this ship is still in flying condition and was used for flying over the Barnhart "Twin" during the latter's christening ceremonies, last August.

Meeting of the I.A.T.A.

A meeting of the International Air Traffic Association recently held at The Hague was attended by the following persons: M. Hermant, representing the Compagnie Franco-Roumaine; Mr. Jacobson, representing the Svenska Luft Trafik Aktiebolaget; Mr. Meisterlin, corresponding member of the Association for Norway and representative of Det Danske Luftfart Selskab; M. Pierrot, representing the Compagnie des Messageries Aériennes; Lieut. Plesman, of the K. L. M.; Mr. Renaud, representing the Société Nationale pour l'Etude des Transports Aériens, and Herr Wronsky, representative of the Danziger Luft Reederei and the Deutsche Luft Reederei.

The Belgian (S. N. E. T. A.) and the two French companies (Franco-Roumaine and Messageries) are now members of the I. A. T. A., and their representatives acted only as observers.

Lieut. Plesman, manager of the Royal Dutch Air Navigation Co. (K. L. M.) was elected chairman.

Discussion of plans for the next summer resulted in the following international lines being decided on:

1. London-Amsterdam-Bremen-Hamburg-Copenhagen
2. London-Amsterdam-Bremen-Hamburg-Berlin
3. London-Brussels-Dortmund-Berlin
4. London-Paris-Lyons-Geneva
5. London-Paris-Lyons-Marseille.
6. Amsterdam-Brussels-Geneva.
7. Paris-Strasbourg-Prague-Warsaw-Vienna-Budapest -Bucharest-Constantinople
8. Koenigsberg-Moscow, communicating with the railway service between Berlin and Koenigsberg.

It was further decided that the Central Office should issue regulations for aerial services landing upon all the companies which were members. The Central Office was invited to communicate with the Secretariate of the International Postal Union, in order to call that Union's attention to the fact that, although it was impossible to maintain regular services throughout the whole year, such services were possible from April to September, so that during that time the mail can be regularly carried by airplane. The Central Office was also invited to communicate with the Traffic Committee of the League of Nations. Efforts will be made in the direction of simplification of customhouse formalities.

It was further decided that motors should be equipped with exhaust silencers, that large passenger airplanes should carry a pilot and assistant pilot; that machines destined for flights lasting over 4 hours should be equipped with a lavatory, and that the main parts of the machines should be constructed in such a manner as to be easily exchangeable.

The French, Belgian and Czecho Slovak companies have been invited to become members of the Central Office.

The next meeting will be held on July 31 next, probably at Brussels.

Dornier "Dragonfly" Lands on Ice

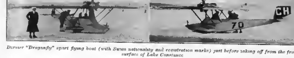
Stimulated by the aviation societies of the northern countries of Europe a series of tests has recently been made on the ice of the Swiss part of the Lake of Constance, the Lower Lake, which has demonstrated that ice landings with metal flying machines is not only absolutely without danger but also that a safe landing can be made by anyone who knows how to manage a flying machine without difficulty.

How absolutely necessary it is to have a type of flying machine that can make landings on ice without any danger of any damage being done can be gaged from the fact that during the winter the air communication is at a standstill in the northern countries and this is just at a time when on account of the stopping of the steamship communication the aviation, which is fighting hard for its very existence, is deprived of a good source of profit. In these countries it is a coast-wise communication, which, during the summer can be taken care only with the help of seaplanes. As, for economical reasons the air transport companies cannot afford to put into operation flying machines with special equipment of snowshoes for landings on ice, they are forced to use their regular equipment, which consists mostly of seaplanes. It must also be borne in mind that the flying machines must be able, even in winter, to make emergency landings on water.

Some landings on ice have been made during the war with seaplanes, although by a repetition of such landings some damage was always done to the equipment and the use of the machines as seaplanes for landings on water became then illusory because the floats filled with water. Tests made in the northern countries have also proven that landings on ice cannot be safely made with wooden frame flying machines.

The landings on ice on the Lower Lake were made with the 55 hp. Dornier sport flying boat "Dragonfly." The start was made from the water about 40 km. (about 25 miles) from the spot where the landing on ice was to take place. The load was 205 kg. (about 450 lb.) and consisted of the pilot, the assistant and a full load of gasoline. After flying for about 18 min. the seaplane was above the completely frozen Lower Lake and made a successful landing on the lightly snow covered ice surface. After several skating tests which had the object of determining the possibility of steering the flying machine in order to get a start, a start was made from the ice and the start required only from 12 to 14 sec. on account of the very low resistance offered by the surface of the ice.

In order thoroughly to test the serviceability of the flying boat, several more starts and landings were made alternating on snow covered ice and on polished ice. Tests were also made with wind from the side and from behind. All tests have given very satisfactory results.



Dornier "Dragonfly" sport flying boat (with Swiss nationality and registration marks) just before taking off from the frozen surface of Lake Constance

Airship Service to India and Australia

Some time ago the British Government decided to discontinue the use of airships as part of its aeronautical program, and just recently concluded arrangements whereby all of its airships and equipment were to be turned over to the Disposal Board. Coincident with this decision an offer has been made to the British government with a view to rescuing that country's airship fleet from destruction and inaugurating regular passenger and mail services to India and Australia.

Commander C. Dennis Burney, following his investigation of the position of airship development in Great Britain, has issued a circular letter pointing out that owing to the perfecting of recent inventions he found that an imperial air line could be started to India, Australia and China—one that would be on a true commercial basis; that the time of transport would be cut to one-third of that now existing, and the cost per passenger would be slightly less than that for first-class existing fares.

Commander Burney stated that the largest engineering and oil companies in Great Britain are associated with him in this project. The offer to the government, he said, stated that a company would be formed, having available a capital of £4,000,000, made up of £1,800,000 in ordinary shares and £2,200,000 in debentures, for the purpose of establishing a mail and passenger service to India and Australia, subject to the government arranging by means of a subsidy a guarantee of dividend and interest for a period of years. Of the share capital, Messrs. Vickers, Ltd., had undertaken to subscribe for 100,000 shares at par, and the Shell Oil Co. 100,000 ordinary shares or debentures at par.

There was a stipulation that the government should transfer to the company free of cost all airships, airship material, and airship bases—such as Pulham, Cardington and Howden—and supply wireless telegraphy and meteorological services. The existing ships would be used only for short flights and training, and new ships would be built capable of carrying 100 passengers and eight to ten tons of mail at a cruising speed of 60 m.p.h.

If the scheme is approved, traveling time from London to the Dominions will be reduced as shown below:

	By air	Now by ship
Bombay	3½ days	17 days
Rangoon	7½ days	21-22 days
Hong Kong	8½ days	4-5 weeks
Australia	12½ days	4-5 weeks

The new ships would be capable of reaching India with one stop, or Australia with three stops.

Dividing the subsidy between the countries which would obtain the benefit of the airship service, the cost would be, per year: Britain £91,000, Australia £40,000, India £40,000. These dividend and interest payments would cease as soon as the profits from the company were sufficient to pay them.

The program of development has been divided into two stages:

(1) Bi-weekly service to India. (2) Alternate day service to India, with a weekly extension to Australia.

Many new factors have arisen to inspire the belief that this scheme will be successful. A carburetor which will use petrol or oil combined with hydrogen will now permit the load of a ship to be increased by 40%, the life of an engine has been increased from 150 to 400 or 500 hours, and hydrogen produced by the latest process costs only 4s. per 1,000 feet instead of 20s. per 1,000 feet. The cost of the ship itself, due to standardized design and the fall in prices, can be reduced to from £125,000 to £150,000 each, representing a reduction of £40,000 a year per ship.

Flying Meet at Wichita Falls

Great success attended the three-day flying meet held by the American Legion at Wichita Falls, Tex. The date of the meet was originally set for April 29 and 30, but after a good flying day on the 29, it rained, which caused a postponement of one week. During the three days there was not an accident, and although on the last day the pilots had a 30-mile wind to contend with, and every part of the program was thoroughly carried out, even to the many parachute jumpers.

The program for the three days meet was as follows:

First Day, April 29

Battle Formation by Government Planes.
Curtiss 30-mile Race—
H Foster, Dallas, Tex —1st place, time 19 min 6 sec.
B. Good, Dallas, Tex.—2nd place
Barell Tibbs, Wichita Falls, Tex.—3rd place
Five-Minute Altitude Climb by Government Planes—
Sergeant Colby of Post Field—1st place, reaching an altitude of 3,000 ft. Other contenders in this event were —Lieutenants Schultz, Brookley, Wagner, and Davis, all with DH4 planes.

Lieutenant Brookley gave one of the most daring exhibitions ever witnessed, doing every kind of stunt known in aviation.

Major Lohman, Commandant of Post Field, headed the thirty pilots and mechanics who attended the meet in fifteen machines from Fort Sill, Okla He expressed himself as highly pleased with the meet Captain Griffin, official photographer of Post Field, attended the meet, and during the afternoon took several movie films of the contests and exhibitions.

Major Lohman made clear the fact that the Army pilots were not competing with civilians in the meet and that their visit was only a part of their drilling and because of their natural interests in meets of this kind

Wing Walking by Ed Lirette, Dallas, Tex.—

Lirette gave one of the most daring exhibitions ever seen in the South

Laird Swallow and Lincoln Standard 30 mile race—
W H Beech, Wichita, Kans.—Laird Swallow—1st place, time 17 min 30 sec.
K. R Garver, Attica, Kans—Laird Swallow—2nd place
E M Laird, Wichita, Kans.—Laird Swallow—3rd place.
Free-for-all Acrobatic Contest—
Erret Williams, Arkansas City, Kans.—Curtiss—1st place
M. M Merrill, Dallas, Texas—Curtiss—2nd place
B Good, Dallas, Texas—Curtiss—3rd place
Parachute Spot Landing Contest—1500 ft
Frank Armstrong, Ponca City, Okla —1st place
Ed. Lirette, Dallas, Tex —2nd place.
C B Bretel, Dallas, Tex —3rd place
"Miss Mystery" also made a high class parachute jump

Second Day, May 6

Formation Flying over the city
30 Mile Curtiss Race—
H Foster, Dallas, Tex.—Curtiss—1st place—time, 20 min 14 sec.
B Good, Dallas, Tex —Curtiss—2nd place
Chas. Matherly, Wichita Falls, Tex.—Curtiss—3rd place
Wing Walking by Ed. Lirette and Frank Armstrong
Laird Swallow—Lincoln Standard Race—12 miles—two turns
W H Beech, Wichita, Kans.—Laird Swallow—1st place—time 7 min 5 sec
E M Laird, Wichita, Kans.—Laird Swallow—2nd place.
K R Garver, Attica, Kans.—Laird Swallow—3rd place
Free-for-all Acrobatic Contest—
Erret Williams, Arkansas City, Kans.—Curtiss—1st place.
W H. Beech, Wichita, Kans.—Laird Swallow—2nd place.
B Good, Dallas, Tex.—Curtiss—3rd place
Parachute Spot Landing Contest—1500 ft
Ed Lirette, Dallas, Tex.—1st place.
C B. Bretel, Dallas, Tex.—2nd place.
F Armstrong, Ponca City, Okla.—3rd place

Third Day, May 7

Battle formation flight over city
Parachute jump by C B Bretel
American Legion Free-for-all handicap race—
W. H. Beech, Wichita, Kans.—Laird Swallow—1st place—time 21 min.
H Foster, Dallas, Tex —Curtiss—2nd place—time 21 min. 13 sec
B. Good, Dallas, Tex —Curtiss—3rd place—time 21 min. 18 sec
Wing Walking by Ed Lirette.
Spot Landing Contest with Dead Motor.
W H Beech, Wichita, Kans.—Laird Swallow—1st place.
Cyle Horchem in Laird Swallow —1st place.
Erret Williams, Arkansas City, Kans.—Curtiss—3rd place.
Looping Contest—
W. H Beech, Wichita, Kans —Laird Swallow—1st place—23 loops.
Cyle Horchem, Kans.—Laird Swallow—2nd place
K. R. Garver, Attica, Kans.—Laird Swallow—3rd place.
Upside down Flying Contest—
Cyle Horchem in Laird Swallow—1st place.
Dick Phillips in Laird Swallow—2nd place
Parachute Jump by "Miss Mystery"

Sgt Encil Chambers, holder of the World's altitude record for parachute jump closed the meet making a 13,000 ft jump in 30-mile wind

The judges for the meet were Pilot Pat Murphy, Dallas, Tex , Pilot J G L Howard, Wichita Falls, Tex ; and Pilot E B Lopp, Wichita, Kans.

On the return from this meet from Wichita Falls, Tex , to Wichita, Kans., a distance of 300 miles, two Laird Swallows made the trip on a non-stop flight in 2 hr 50 min , piloted by E M. Laird and W H Beech

Book Review

The Forest Products Laboratory. A Decennial Record, 1910-1920 (Published by the Decennial Committee, Howard Weiss, Chairman, Madison, Wis)

On the occasion of the tenth anniversary of the foundation of the Forest Products Laboratory, July 22, 1920, several hundred representatives of America's diversified wood-using industries assembled at Madison, Wis., as a mark of tribute to the excellent work done by this institution.

The book under review records in part the celebration and gives beside the history of the F P L with an account of its activities. The aircraft industry owes much to the research work done by the F P L in the matter of kiln drying, the properties of different species of wood and veneer, and their utilization, which this institution was the first to undertake in a systematic way Much of this information was published in past issues of Aviation and has proved of great value to designers of aircraft The Forest Products Laboratory is to be congratulated upon its splendid record which is a credit to its personnel

La Photographie Aerienne. By Andre H. Carlier 204 pp 118 ill (Librairie Delagrave, Paris.)

The author, who was in command of an aerial photographic section of the French air service during the late war, and later, in this connection, was attached to Cornell University, teaching aerial photography, has given in this book a very elaborate account of the theory and practice of this fascinating subject.

The book describes in detail the various types of aerial cameras employed in the war, both Allied and German, their utilization in warfare, the equipment of the photo sections and the work of interpreting aerial photographs with and without camouflage A chapter is devoted to the evolution of aerial photography during the war, and a closing chapter deals with the future applications of this phase of aviation

ARMY AND NAVY AIR NEWS

Air Service

Army Orders—The resignation by First Lieut Delbert Emerick Jones, A S , of his commission as an officer of the Army, effective June 1, 1922, has been accepted by the President.

First Lieut Carl H Myers, A S., Mather Field, Calif , transferred to the Hawaiian Dept., will sail from San Francisco July 5

First Lieut. Alfred W. Marriner, A.S , is transferred from the Hawaiian Dept. to Rockwell Air Intermediate Depot, Calif.

Warrant Officer John W Curcoran is transferred from Philippine Division headquarters to Kindley Field, P I , for duty with the 17th Balloon Company

Warrant Officer Joseph Rosenblatt is transferred from Balloon Group, Manila, P I , to Philippine Division, Ft. William McKinley, P I

Maj Ralph P Cousins, A S ; Capt Lawrence P Hickey, A S , and First Lieut Leonidas L. Koontz, A S , on temporary duty at Sheffield Scientific School, New Haven, Conn , are directed to proceed in turn to New York City, Newark, N J. Tuckerton, N J , Trenton, N J., Baltimore, Md , Annapolis, Md., Arlington, Va., and Washington, D C , to obtain a more practical understanding of the manufacturing processes and new developments in communication Upon completion of this temporary duty Major Cousins will proceed to Bolling Field, D C , Captain Hickey to Post Field, Okla , and Lieutenant Koontz to McCook Field, Ohio

First Lieut Roy T McLamore, A S Carlstrom Field, Fla., is transferred to the 6th Infantry, Camp McClellan, Ala

First Lieut Robert E Robillard, A S , is transferred from Carlstrom Field, Fla , to Brooks Field, Tex.

First Lieut. Joseph I Sullivan A S , Ross Field, Calif , will proceed to Brooks Field, Tex for assignment to one of the organizations ordered to Panama

First Lieut Halsey L. Bingham, A S , relieved from further duty at Ft Sam Houston, Tex , and at Langley Field, Va , is transferred to Kelly Field, Tex

First Lieut James T Cumberpatch, A S , is transferred from Carlstrom Field, Fla to Kelly Field, Tex

First Lieut. Solomon B Ebert, A S., relieved from duty as student officer at Post Field, Okla , is assigned to permanent station at Sheffield Scientific School, New Haven, Conn. He is assigned to temporary duty with the summer training camps, Second Corps Area, with station at Mitchel Field, N Y , from June 25 to Sept. 1, 1922

First Lieut. Charles B Howard, A S , San Antonio, Tex.; and First Lieut Donald D Fitzgerald, A S , Post Field, Okla , relieved from duty as student officers at Post Field, Okla., are assigned to permanent station at Camp Alfred Vail, N J Each officer is assigned to temporary duty with the summer training camps, Second Corps Area, with station at Mitchel Field, N. Y., from June 25 to Sept 1, 1922

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Kelly Field—Four formations of five planes each assisted in the annual celebration of the Battle of Flowers of the Fiesta San Jacinto on April 21 After flying for about an hour over the parade in San Antonio, the XB1A formation broke up over the Alamo and dropped floral bombs on this historic old building The Attack Group entered as its representative in the parade a DH4B airplane stripped, mounted on a trailer and artistically decorated with streamers of the old and new Air Service colors, fully equipped with machine guns, bomb sights, generators and other general equipment required for attack planes

Lieutenant Canfield, Communications Officer for the 2nd Bombardment Group at Kelly Field, recently demonstrated radiophone communications between a plane and the ground. A radio truck was stationed in front of the Alamo, San Antonio, and from a large amplifier in the roof of the truck the voice from the plane overhead was heard clearly and distinctly by a large and interested audience.

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Ellington Field—A class of eight student officers, training in advanced pursuit, were graduated at Ellington Field on April 23. Graduating exercises consisted of an aerial review by the Commanding Officer of the post and the Academic Board. Two formations of three SE5's each and one formation of five SE5's passed in review, after which they performed a series of maneuvers in formation The following officers composed the class: Maj E. H Brainard, Marine Corps, Capt. George C Tinsley and Lieuts. Walter H. Reid, Claire L. Chennault, E E Glenn, John D. Barrigar, John K Cannon and Donald F Stace, Air Service

During the past week twenty-three officers of the 1st Group (Pursuit) participated in cross country flights, the flying time aggregating 105 hr To date six cross country flights to Kelly Field have been successfully made in Thomas Morse pursuit planes. The gas capacity of this plane is just sufficient for this flight of 200 miles, the average time being 1 hr 40 min.

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Post Field—Fourteen ships (DH's) from Post Field, Fort Sill, Okla., paid a visit on April 22 to Muskogee, where the Headquarters 95th Division, Air Service, is located

Maj Thomas G Lanphier, Officer in Charge of Flying at Post Field, with Capt Alexander Mileau, Flight Surgeon at Post Field, was in charge of the flight Capts. Vernon L Burge and Frank L. Pritchard were the other officers of the permanent garrison making the flight The following student officers of the Air Service Observation School, for whom the flight was a practice cross-country flight, were among those present Captain DuFord, Captain Derby, Lieutenants Shrader, Vidal, Wisehart, Davidson, Stackhouse, Shen (Chinese Navy), Cooper (Chile), Evert, Williamson, Peck, McBlain, Schabacker, and four mechanics.

Capt Charles B Oldfield, Executive Officer of the 95th Division, Air Service, was on the field to meet the visitors. After all had arrived Major Lanphier led a 5-ship formation over Muskogee, with Captain Oldfield and Lieuts Vidal, Shrader and Davidson following

The secretary of the local Chamber of Commerce, Mr Lydig was on hand to greet the visiting fliers, as were also newspaper representatives and a number of citizens of Muskogee. Each visitor as he arrived on the field was given a complimentary card by the Secretary of the Chamber of Commerce which entitled him to hotel accommodations at one dollar per day and several other advantages.

The landing field at Muskogee, which is maintained by the Muskogee Airplane Co was dubbed by someone as Hat-Box Field, on account of the similarity of the hangars to ladies' hat boxes, with the black and white strips running vertically. Each hangar is small and built just to hold one DH

Matters in the 320th Observation Squadron (the Air Service unit of the 95th Division) are coming along splendidly The Executive Officer is busy getting from the officers a record of their air experience, with a view to the reassignment of duties more commensurate with each officer's abilities. Second and third priorities (Corps and Army Groups) have not been authorized as yet, but the Executive Officer has lists prepared for the assignment of officers to these groups as soon as authorized

Air Service to Participate in Pulitzer Race—To insure representation in the Pulitzer Race at Detroit, September next, of the latest types of American high speed planes which may be susceptible of development into pursuit ships, the Air Service has placed orders for one experimental machine each with the following constructors

Lawrence Sperry Aircraft Corp, Farmingdale, L. I., to designs of Lawrence Sperry and Alfred Verville, Wright engine

Curtiss Aeroplane & Motor Corp, Garden City, L. I., Curtiss 440 hp engine.

Thomas-Morse Aircraft Corp. Ithaca, N. Y, Packard engine.

Loening Aeronautical Engineering Corp, New York City, to designs of Grover P. Loening, for any type of engine selected.

It is understood the designers have been given *carte blanche* by the Air Service in an effort to produce the fastest machines ever constructed in America. While the spectacular features of high speed from the standpoint of creating public interest in the Pulitzer Trophy race were given consideration in placing these orders, the possible military value of the machines and the definite stimulus to American design and engineering are the principal factors. At the same time, with several of America's foremost designers given a free hand there is reasonable assurance that the world's speed record will be added to the other notable records held by American machines.

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84th Division Air Service—The present commissioned personnel of the 84th Division Air Service, Organized Reserve, has been increased over 100 per cent in the past six weeks, and now numbers twenty officers. Applications for reserve commissions in the Air Service, with a view to assignment to this organization, are being received daily.

The 84th Division is assigned to the State of Indiana, but the fact that several pursuit squadrons have been assigned to Indiana, in addition to other Air Service units, had tended to so diminish the available personnel that it was deemed advisable to assign the Divisional Air Service, (which includes one Air Service staff officer, one observation squadron, one photo section and one branch intelligence office), to the City of Cleveland, Ohio, where there is undoubtedly a sufficient number of qualified personnel to fill these units

Residing in Cleveland are a number of former naval flying officers and officers of the Royal Flying Corps, who served during the war. They are excellent material for the Air Service Officers Reserve Corps, and Lieut Langhorne W. Motley, of the Air Service, Regular Army, who has been assigned to the 84th Division, is in hopes that some means may be found whereby it may be possible to grant commissions to these men.

Lieutenant Motley, whose duty it is to give all assistance in his power to obtain the personnel and organize these Air Service units, and to assist in every way possible all Organized Reserve activities in the section to which he is assigned has, through the courtesy of the Ohio National Guard, been given an office in the Central Armory at Cleveland. He is being ably assisted and supported in his work by the Cleveland Chamber of Commerce, the Flyers Club, and numerous other organizations and individuals

Maj. William Frew Long, who was recently assigned to the 84th Division, Air Service, was on May 1 assigned to command this unit, relieving 1st Lieut John N. Joyce, who was its first commanding officer

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316th Reserve Squadron—After many trials and tribulations, the 316th Reserve Squadron has finally gotten under way. With the assignment of Capt A. F. Herold to duty as Air Officer for the 91st Division, San Francisco, the final obstacle to actual work was removed. Two Hissos were acquired for the instruction of the pilots, and an old DH for the instruction of the enlisted personnel. A Staff Sergeant and four specialists were detailed to temporary duty with the squadron.

There are assigned for duty to the Squadron thirty-three officers, leaving a shortage of only two for the full 100 per cent. Enlistments are being sought, it being the intention to enlist the men in a body when a complement of about 50 per cent of the authorized strength has been acquired. Also twenty-five men are now taking instruction.

The 316th Photo Section has its full officer personnel, and is about ready to enlist its full quota of men.

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Air Service Reserve Units, Middle West—The Air Service Units assigned to Headquarters 5th and 15th Army Corps for administrative purposes comprise the Corps, Army and General Headquarters Reserve organizations for the Second and Fifth Field Armies, which in turn consist of two Headquarters Army Air Service, one Headquarters Corps Air Service, one Headquarters Wing Air Service, two Groups (Pursuit), two Groups (Observation), two Groups (Balloon) and one Group (Airship).

The individual squadrons, companies, air and balloon parks, photo section, etc., have been allocated to different localities in the States of Ohio, Indiana, Kentucky and West Virginia, and, at the present time, work upon the actual organization of these Air Service units is definitely taking shape. During the past six weeks approximately 225 reserve officers have been assigned to organizations, with the same number awaiting replies to letters sent out giving a choice of assignment.

It is very doubtful if those not directly connected with the Organized Reserves realize either the amount of interest taken in the Air Service as a whole by these ex-pilots or the *esprit de corps* which is developing upon the assignment of these men to regularly organized squadrons. This is true for both commissioned and enlisted personnel of the Reserve Corps. With the assignment of recruiting officers to the different states, there are being found many of the old hangar and crew chiefs who have not forgotten the feel of a swinging prop and who are willing enough to enlist in their old grade in a live organization.

On April 18 the Aero Club of Cincinnati, practically every member of which holds a commission in the Air Service Officers Reserve Corps, gave a dinner, with approximately 100 members and guests in attendance. Speeches were made by Col Peter E Traub, Cavalry, Maj Thurman H Bane, Maj. Maxwell Kirby and Lieut. J A Macready of the Air Service, and the Presidents of the Chamber of Commerce, the Business Men's Club and the Automobile Club. The object of the dinner was to arouse interest in the Air Service and of the Organized Reserves in this vicinity and to secure a municipal landing field for the city of Cincinnati. As a result Cincinnati soon will be represented on the aerial highways of the country by a field fully equipped to handle any present or future developments in the air

Naval Aviation

More Reserve Officers Ordered Home—Following is an additional list of Naval Reserve Officers ordered "to home, and wait orders."

Lt. Comdr Willis B Haviland, Naval Air Station Anacostia, D. C., Lieut. Frederick H Becker, Bu. Aeronautics Navy Dept., Lieut Paul E Gillespie, Naval Air Station Anacostia, D. C., Lieut. Patrick E Kearney, Naval Air Station Pensacola, Fla., Lieut. Clarence N Keyser, Bu. Aeronautics Navy Dept., Lieut Arthur Lawrence, Air Squadrons Pac Flt., Lieut Leonned Marbury, Naval Air Sta Anacostia, D C; Lieut. William F. Reed Jr, Bu Aeronautics Navy Dept.; Lieut. Walter L. Richardson, Bu Aeronautics Navy Dept.; Lieut Hugh W. Rongbley, Bu Aeronautics Navy Dept; Lt (jg) James J McAtee, Naval Operations Navy Dept; Lt (jg) Marion Butler Jr, Naval Air Station Anacostia, D C; Lt (jg) Elmer A Letzkus, Naval Air Station Anacostia, D C; Lt (jg) Robert M Parsons, Naval Air Station Anacostia, D C

(In the case of Lieut P E Kearney the order reads "to home" only.)

Comdr. Albert H. Taylor, det. Naval Air Station Anacostia, D C., to wait orders.

Naval Air Appropriation Bill in Senate—During the hearings on the Navy Bill before the Senate Appropriations Committee Admiral Moffett asked for increases over the bill as passed by the House of $9,058,200.

An item of $568,500 to equip all new naval airplanes for use with the fleets with radio, was requested, as the 213 new planes would be practically useless without radio, Admiral Moffett pointed out. An increase from $5,475,000 to $7,093,100 was also asked for maintenance, repair, and operation of aircraft factory helium plant, air stations, fleet activities, testing laboratories and overhauling planes. Admiral Moffett explaining that this request was for the restoration of what was originally asked by Secretary Denby and passed by the Budget Bureau. Originally $6,617,000 was requested for maintenance and $475,000 for the purchase of catapults for certain ships. The House, it appears, reduced the first item to $5,000,000 and added $475,000 for catapults to maintenance, including it in one item. Last year's maintenance cost the Navy $6,400,000 for aviation, Admiral Moffett said, under rigid economy and after closing four stations.

When asked for annual appropriations by foreign countries for naval aeronautics Admiral Moffett submitted the following table:

		Total
Aviation U. S. Army	$15,000,000	
Navy	17,000,000	$32,000,000
Gt. Britain (Excluding R.A.F. in India, civil aviation and colonial aviation)		66,424,600
France (1921-22) Army, Navy, Colonies and Public Works		44,600,000
Japan (Minimum, 1921-22)		18,723,681

British aerial personnel it was explained approximated

R.A.F. Jan 1, 1922, 3067 officers and 27,813 men, a total of 30,880, according to Naval Intelligence, and 31,176 according to R.A.F.

Indian Air Force, Jan. 1, 1922, 1500 officers, 3000 men total 4500

If the Royal Air Force was separated into naval and military air forces Admiral Moffett indicated that the division would approximate 514 officers and 8487 men, totaling a naval air force of 0001. In the event of war it was said that these figures would be increased from 50 to 100 per cent, and about 1000 should be added for R.A.F. personnel engaged in naval administrative duty. There were on May 7 2916 officers and 26,367 men in the R.A.F.

A total of $6,537,000 was asked for the construction of 213 planes for the fleet and $500,000 for new construction, buildings and improvements at air stations. The last item was omitted by the House on the grounds that that body had no jurisdiction over the construction of aircraft stations, but the report estimated that approximately $7,306,525 would be needed for new aircraft and $500,000 for new aircraft stations. The addition of these items brought the requirements of the Navy for aeronautics to practically the Budget figures, $16,925,550 instead of $7,866,850 as carried in the House Bill.

Regarding the items asked for under new buildings, Admiral Moffett said that $150,000 was for a new hangar apron and runway at Pearl Harbor; $50,000 for improving landing field at Pensacola, $150,000 for hangar and storehouse at San Diego, $12,000 for magazine at San Diego, $50,000 for storehouse and hangar at Anacostia; $80,000 for a hangar at Quantico, making a total of $500,000

An increase of $9,500 for salaries of draftsmen and technical assistance or a change from the house figures of $65,000 to $74,449.40. The purchase of the land on which certain Naval Air Stations are built for about $67,000 was also recommended the figures or prices amounting about as follows: Galveston requiring $13,600 for purchase but worth $200,000 and not desired as a station; Chatham $41,000; Lakehurst, $15,000, Quantico, $20,000, totaling $89,000 but $13,000 could be turned back against the appropriation if Galveston site was sold, requiring a total of $76,000. The site at Sand Point, Wash., was indorsed by Admiral Moffett as a suitable and valuable Naval Air Station, as the only other station on the Pacific Coast is at San Diego. No appropriation was asked however for the purchase of this site.

The status of the construction of the German Zeppelin for the Navy as a reparation ship to be known as the ZR3 was said to be settled and it was hoped that it would be finished within a year, it was said at the hearings. On the ZR1 being built in this country, the Navy has spent about $1,500,000 it was stated, and $400,000 was estimated as the amount needed to complete it by next June. She is estimated as about 50 per cent complete today, and will be inflated with helium, Admiral Moffett said.

The sum of $400,000 was asked as a maintenance fund for helium, which with Army's $400,000 fund would keep the plant at Fort Worth operating for about a year. It is hoped to reduce the production cost of helium to a quarter of what it is today, it was stated. The helium on hand for Navy and Army purposes totals now 2,400,000 cu. ft.

The cost of operation and maintenance of aircraft for the fiscal year ending June 30, 1921, was $4,167,503.

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Reserve Orders—The following reserve officers have been honorably discharged from active service: Lieut. Frank L. Burk, Lieut. Lester B Hutchinson, Lieut. Joseph H. Parent, Lieut. (jg) Lefain T. Kittredge, Lieut. (jg) Albert C. Lake, Lieut. (jg) William L. Shields, all det. U S S Aroostook; Lieut Thomas H Chapman, det. Naval Air Station Lakehurst, N. J; Lieut. Walter C. Bryan, det. Naval Air Station Coco Solo, C. Z., Lieut. Albert C. Cromwell, det. Naval Air Station Hampton Roads, Va.

"Home and wait" orders have been revoked for Lt. Comdr. Willis B Haviland, Lieut. Paul E Gillespie, Lieut. Elmer A. Letzkus, Lieut. Leonned Marbury, all of the Reserve Force.

Lieut. LeGrande F. Kirk, det. Naval Air Station Pensacola, Fla.; Lieut Leland F. Noble, det. Naval Air Station Pensacola, Fla.; Lieut. Howard A. Beswick, all "to home."

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Bureau of Aeronautics—Admiral W. A. Moffett, Chief of the Bureau of Aeronautics, Navy Department has received the following letter, dated April 26, 1922, from Aeromarine Airways, signed C. F. Redden, president:

"We desire to formally express to you and your Department our appreciation and gratitude for the splendid cooperation extended us in connection with the search for the "Santa Maria", and, through you, we wish to convey to Captain Johnson, Commanders Read and Bartlett, and Lieutenant Miller our earnest thanks for the highly efficient and vigorous manner in which they responded to our call.

"Their willingness to lend every possible assistance and the alert manner in which they organized their patrol was in keeping with the best traditions of the Navy."

Coming Aeronautical Events

AMERICAN

June 15-17 —	*Flying Meet, Monmouth, Ill.*
Sept. 4 (about) —	*Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)*
Sept 15 (about) —	*Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)*
Sept 30 —	*First Annual Interservice Championship Meet. (In preparation.)*

FOREIGN

August —	*Coupe Jacques Schneider. (Seaplane speed race.) Naples, Italy*
Aug. 6 —	*Gordon Bennett Balloon Race, Geneva, Switzerland.*
Aug. 6-20 —	*Soaring and Gliding Competition, Clermont-Ferrand, France.*
Aug. 9-24 —	*Soaring and Gliding Competition, Gersfeld, Germany.*
Sept. 22 —	*Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France. American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.*

Foreign News

Germany—Consul Dreyfus, Dresden, reports to the Department of Commerce that on April 1, a daily passenger, mail, and freight air service was reestablished on the line Dresden-Berlin-Hamburg and return; also on the line Dresden-Leipzig-Magdeburg-Hanover-Bremen and return. The trip from Bremen to Hamburg takes 4½ hr., including a half-hour stop in Berlin. The journey to Bremen requires five hours, including 15-min. stops at Leipzig, Magdeburg, and Hanover.

The fare from Dresden to Berlin is 500 marks and from Berlin to Hamburg 650 marks. This compares with 285 marks and 387 marks, respectively, for the first-class railway fare between the same points. Passage from Dresden to Leipzig is 500 marks and from Leipzig to Bremen 1,300 marks, as compared with 190 marks and 536 marks, respectively, for first-class railway fare between these points. Fifteen kilos of baggage is carried without charge, and all excess at the rate of 15 marks per kilo.

It is reported that a service from Dresden to Prague will be inaugurated in June.

* * *

Belgium—Acting Commercial Attaché Cross, Brussels, reports that the "Sneta", a government-subsidized aerial transportation company in Belgium, has finished its trial period of passenger, merchandise, and postal aerial transport service between Brussels and cities in neighboring countries (Paris, London, Amsterdam, The Hague). Belgian participation on these lines will, therefore, cease from June 1, 1922, leaving the Paris-Brussels and Brussels-Amsterdam services in the hands of French and Dutch companies. A Brussels-London service will be organized by an English company, beginning in May of the present year.

The Belgian government is studying the creation of a permanent organization which will permit that country to conserve an important position in international aerial transportation.

* * *

Venezuela—Vice Consul S. J. Fletcher, at La Guaira, states that excepting a few exhibition flights made at Caracas, the capital, there have been no attempts to introduce civil or commercial aviation in Venezuela. For military aviation, a branch of the Venezuelan Army has been organized, known as the Infantry Aviation Company, made up of two officers and 62 men, with headquarters at Maracay, State of Aragua. During 1921 instruction in military aviation was given by three officers in the French Military Mission to twelve students, of whom eleven succeeded in flying alone, and five qualified as pilots.

The equipment consists of six Caudron and two Farman airplanes, and two Caudron and two Farman seaplanes. A considerable amount of machinery and equipment has been bought from the French Government, but the equipment on hand is considered insufficient, and instruction in flying has ceased, awaiting the purchase of further equipment which the instructors have recommended to be secured from France. Plans for improved landing fields and the establishment of several flying routes have been held up from lack of funds, and it is expected that the waning interest in aviation will prevent the passage of a sufficient appropriation to execute these proposals in the near future.

* * *

New Zealand—The Auckland Service Aero Club has completed negotiations with the New Zealand Aero Transport Co. for the amalgamation of their interests in the Auckland district. The combined interests plan to link Auckland with Wellington by air and to establish branches from those points. Government cooperation will be enlisted in having regular air routes surveyed and plotted and suitable landing grounds established with the key airdrome at Auckland. Arrangements have already been made for the importation of three airplanes, and additional capital to the amount of £20,000 is being raised by subscription in Auckland for the erection of the airdrome.—Commerce Reports.

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